

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

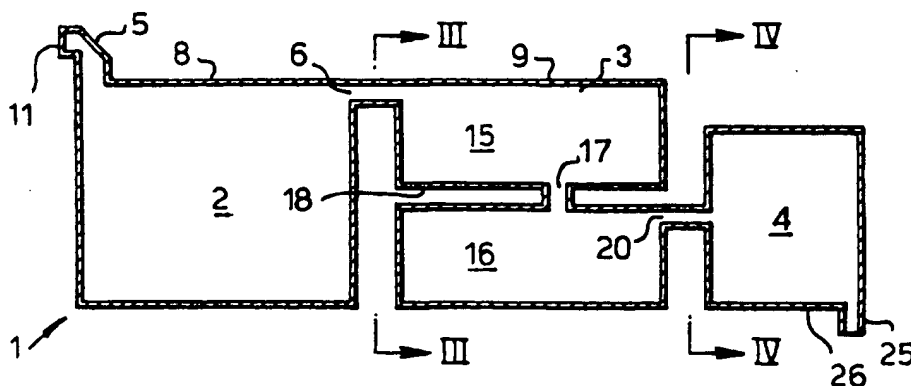
**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> : <b>D06F 39/02</b>		<b>A1</b>	(11) International Publication Number: <b>WO 00/49218</b>
			(43) International Publication Date: <b>24 August 2000 (24.08.00)</b>
(21) International Application Number: <b>PCT/EP00/00801</b>		(74) Agent: <b>ELLIOTT, Peter, William; Unilever PLC, Patent Department, Colworth House, Sharnbrook, Bedford, Bedfordshire MK44 1LQ (GB).</b>	
(22) International Filing Date: <b>2 February 2000 (02.02.00)</b>			
(30) Priority Data: <b>9903752.5</b> <b>18 February 1999 (18.02.99)</b> <b>GB</b>		(81) Designated States: <b>AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</b>	
(71) Applicant (for AE AU BB CA CY GB GD GH GM IE IL KE LC LK LS MN MW NZ SD SG SL SZ TT TZ UG ZA ZW only): <b>UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London EC4P 4BQ (GB).</b>			
(71) Applicant (for all designated States except AE AU BB CA CY GB GD GH GM IE IL IN KE LC LK LS MN MW NZ SD SG SL SZ TT TZ UG ZA ZW): <b>UNILEVER NV [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).</b>			
(71) Applicant (for IN only): <b>HINDUSTAN LEVER LIMITED [IN/IN]; Hindustan Lever House, 165/166 Backbay Reclamation, Maharashtra, Mumbai 400 020 (IN).</b>			
(72) Inventors: <b>SHERRATT, Paul, Robertson; Elida Faberge Ltd, Coal Road, Seacroft, Leeds, Yorkshire LS14 2AR (GB). SHICKLE, Mark; 14 Carew Road, Ealing, London W13 9QL (GB).</b>		<b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	

(54) Title: **A DOSING DEVICE**

## (57) Abstract

A device for dosing rinse conditioner to a drum of a washing machine comprises three chambers connected in series to an interior of a drum of a washing machine. The first chamber receives the composition prior to a start of the wash cycle and includes an outlet through which the composition is transferred to a holding chamber under centrifugal forces generated during a first spin cycle. During a second spin cycle the treatment composition is similarly transferred from the holding chamber to a dispensing chamber from which the composition is delivered onto the fabrics upon completion of the second spin cycle. A washing process employing the device of the invention is also disclosed.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

- 1 -

## A DOSING DEVICE

### INTRODUCTION

5 The invention relates to a dosing device for fabric washing machines. In particular, the invention relates to a device for dosing fabric treatment composition, and particularly rinse conditioner compositions, into a drum of a top loading washing machine in between a second and third spin cycle of  
10 the machine.

Automatic fabric washing machines generally include a number of distinct stages involving a first washing stage where the clothes are agitated with wash liquor and detergent followed  
15 by a rinse stage where the clothes are rinsed. Generally, the rinse stage comprises three separate spin cycles, a first spin to remove detergent liquor, a second spin to remove the rinse liquor added to the drum between the first and second spins, and a third spin to remove the final rinse  
20 liquor added to the drum between the second and third spins. To achieve an effective treatment of the fabrics it is advantageous to add rinse conditioner compositions to the final rinse liquor between the second and third spin cycles. heretofore this has been effected by manually adding the  
25 rinse conditioner to the drawer of the machine between the second and third spins. However, as this involves visually observing the wash until completions of the second spin cycle it is clearly an inconvenience for the user.

30 In an attempt to overcome the problem with manual dosing of rinse conditioners, certain machine manufacturer developed a device for automatic dosing of rinse conditioner which comprises a pair of chambers connected in parallel and integrally mounted to the drum of the machine during  
35 manufacture of the machine. In more detail, the first

- 2 -

chamber which is exposed in an interior of the drum includes a filling opening and an outlet leading to the second chamber such that during a first spin the rinse conditioner is transferred to the second chamber which lies between inner and outer drums of the machine. The second chamber includes an outlet such that during a second spin cycle the rinse conditioner is sprayed in small droplets onto the outer drum of the machine. A number of problems are associated with this device. First, as the device includes a pair of chambers mounted on opposite sides of the wall of the inner drum, the device cannot be installed in existing machines without structurally altering the drum of the machine. This is clearly inadvisable, not least for the reason that the alteration of the drum would adversely affect the delicate balancing of the drum.

Second, as the second chamber is mounted before the inner and outer drums of the machinery this result in delivering of the product onto the outer drum of the machine. In order for the product to contact the wash water it must have time to run down the side walls of the drum to the sump, however, due to the viscosity of such compositions, this can take some time resulting in an incomplete dosing of the product to the rinse water. This problem is exacerbated by the fact that due to the construction of the device the product is delivered during the second spin cycle resulting in a fine spray of small droplets onto the drum of the machine. Furthermore, the dosing of the product onto the inner drum of the machine has been found to result in a shearing effect on rotors of the drum.

It is one object of the present invention to overcome at least some of the above problems.

35

- 3 -

Statements of Invention

According to the invention there is provided a device for dosing fabric treatment composition to a drum of a top loading automatic washing machine of the type comprising a washing stage and at least two spin cycles, the device comprising at least three interconnected chambers mounted to a drum of the washing machine, namely:-

- 10 - a reservoir chamber having filling opening means and an outlet;
- a holding chamber communicating with the reservoir chamber outlet for receiving said composition from said reservoir chamber during a first of said spin cycles;
- 15 and
- a dispensing chamber communicating with a holding chamber outlet for receiving said composition from said holding chamber during a second of said spin cycles,
- 20 the dispensing chamber further including an outlet for dispensing said composition upon substantial completion of said second spin cycle.

25

Preferably, the holding chamber comprises an upper region which receives and holds treatment composition from the reservoir chamber during the first spin cycle, a lower region which delivers treatment composition to the dispensing chamber during the second spin cycle, and an intermediate region connecting the upper and lower regions such that between the first and second spin cycles the treatment composition is transferred under the force of gravity from the upper to the lower region.

35

- 4 -

Ideally, the intermediate region forms a barrier to prevent the treatment composition passing back from the lower region to the upper region during the second spin cycle.

- 5 Ideally, the upper and lower regions comprise distinct upper and lower compartments and wherein the intermediate region comprises a conduit connecting the compartments.

- 10 In a preferable embodiment of the invention the conduit is arranged on a base of the upper compartment, wherein the base is preferably shaped to funnel treatment composition into the conduit. Typically, the holding chamber has a rear wall facing a wall of the drum of the machine, and a front face, and wherein the conduit is spaced from the rear wall.
- 15 Typically, a base of the upper compartment is shaped to funnel composition towards the outlet, by means of for example, the base being slanted. Ideally, a top of the lower compartment is shaped to direct the composition towards the holding chamber outlet under centrifugal force.

20

In one embodiment of the invention the at least three chambers are connected in series.

- 25 Preferably the device includes means for the mounting thereof to an interior of the drum of the machine. Ideally the mounting means allow retro-fitting of the device

- 30 In a particularly preferable embodiment of the invention the reservoir chamber has a rear portion adjacent the drum of the machine, an opposed front portion, and a top portion, wherein the reservoir chamber outlet means is disposed adjacent the rear and top portions of the chamber.

- 5 -

Preferably, the rear and top portions are shaped to funnel or otherwise bias the transfer of the composition into the reservoir chamber outlet under the centrifugal forces generated during the first spin cycle. Thus, the top and  
5 base may be slanted or curved towards the outlet.

In one embodiment of the invention the holding chamber outlet means is disposed adjacent an upper rear portion of the lower region of the holding chamber

10

Preferably, the dispensing outlet is disposed towards a lower portion of the dispensing chamber. Ideally the filling chamber inlet is disposed adjacent a top of the filling chamber, and preferably spaced from the rear of the chamber  
15 away from the drum of the machine. Typically, the filling chamber includes a closure for the filling chamber inlet.

The invention also relates to a laundry washing machine comprising a device according to the invention. The  
20 combination of a device according to the invention and a fabric treatment composition, such as for example a liquid rinse conditioner, is also envisaged.

The invention also relates to a use of a device according to  
25 the invention for delivering liquid rinse conditioner to an interior of a drum of a washing machine during a rinse cycle.

The invention also relates to a process for delivering  
30 fabric treatment composition to an interior of a drum of a washing machine during a rinse cycle of the machine by



- 6 -

employing a device according to the invention, the process comprising the steps of:-

- 5           -     adding fabric treatment composition to the  
              reservoir chamber prior to a start of wash cycle;
- carrying out a wash stage;
- 10          -     carrying out the first spin cycle whereupon the  
              fabric treatment composition is transferred under  
              centrifugal forces from the reservoir chamber to  
              the holding chamber;
- 15          -     carrying out the second spin cycle whereupon the  
              treatment composition is transferred under  
              centrifugal forces from the holding chamber to the  
              dispensing chamber;
- 20          -     delivering the treatment composition from the  
              dispensing chamber to the interior of the drum  
              under force of gravity prior to and/or during  
              addition of final rinse solution;
- 25          -     carrying out a final rinse cycle by agitating the  
              fabrics, rinse solution and treatment composition  
              for an effective period of time; and
- carrying out a final spin.

30

#### **Detailed description of the Invention**

The invention will be more clearly understood from the  
35 following description of some embodiments thereof, given by

- 7 -

way of example only, with reference to the accompanying drawing in which:-

Figure 1 is a front elevational view of a device according to the invention,

Figure 2 is top view of the device of Figure 1 attached to an inner drum of a washing machine,

Figure 3 is sectional view of the device along the line III-III of Figure 1,

Figure 4 is sectional view of the device along the line IV-IV of Figure 1,

Figure 5 is a front elevational view of a holding chamber according to an alternative embodiment of the invention; and

Figure 6 is a side elevational view of the holding chamber of Figure 5 looking in the direction of the arrow marked X.

Referring to the drawings, and initially to Figs 1 to 4, there is illustrated a dosing device according to the invention, indicated generally by the reference numeral 1, and comprising three chambers connected in series, namely a reservoir chamber 2, a holding chamber 3 and a dispensing chamber 4. In more detail, the reservoir chamber 2 includes a reservoir opening 5, associated closure 11, and a reservoir chamber outlet 6 disposed towards a rear face 7, and adjacent a top 8, of the chamber 2, which outlet 6 communicates with the holding chamber 3 adjacent a top 9 and rear 10 of said chamber 3. The holding chamber 3 is divided into upper and lower compartments 15, 16 connected by means of a conduit 17 located on a base 18 of the upper compartment 15. The lower compartment 16 includes a holding

- 8 -

chamber outlet 20 which leads to the dispensing chamber 4, the outlet 20 being disposed towards a rear and top of the lower compartment 14. The dispensing chamber 4 includes a dispensing outlet spout 25 disposed on a base 26 of the chamber 4.

The device 1 further includes means for mounting thereof to a drum of a washing machine which in this case comprise a pair of suction pads 30 mounted on a rear face of the device 1, which in use engage an interior face 28 of a drum 29 of the washing machine

In use, and referring to Figs 1 to 4, the device is mounted to an interior surface of a inner drum of a washing machine by attaching the suction pads 30 to the drum. Once attached, an effective amount of rinse conditioner is added to the reservoir chamber through the reservoir opening 5 and once added the opening 5 is closed by the closure 11. The machine is then started. During the first rinse cycle, centrifugal forces generated within the drum force the liquid composition within the holding chamber towards the rear and the top of the chamber. Consequently, by virtue of the disposition of the reservoir chamber outlet 6, the composition is forced during the first spin cycle through the reservoir chamber outlet 6 into the upper compartment 15 of the holding chamber 3 where it will be restrained towards a rear of the chamber while the centrifugal forces generated by the first spin cycle remain. Once the first spin cycle has finished, the centrifugal forces will stop, and the composition will pass under the force of gravity through the conduit 17 in the base of the upper compartment 15 into the lower compartment 16. The composition remains in the lower compartment 16 until the second spin cycle begins whereupon the centrifugal forces generated force the composition towards the top and rear of the lower compartment 16,

- 9 -

through the holding chamber outlet 20 and into the dispensing chamber 4. It should be noted that none of the composition passes back into the upper compartment 15 during the second spin cycle due to the fact that the conduit 17  
5 connecting the compartments 16, 15 is disposed towards the front of the respective compartments 16, 15. During the second spin cycle the composition that has entered the dispensing chamber 4 is restrained by centrifugal forces towards the rear of the chamber 4 until completion of the  
10 spin whereupon it falls under gravity towards the dispensing outlet spout 25 in the base 26 of the chamber 4 from which it is delivered into the drum of the machine.

Referring to Figs 5 and 6 there is illustrated a holding  
15 chamber according to an alternative embodiment of the invention, indicated generally by the reference numeral 30, in which parts similar to those identified with reference to the previous embodiment are assigned the same reference numerals. In this embodiment the holding chamber 30  
20 comprises an upper region 31 which receives the filling chamber outlet, and a lower region 32 from which the composition is delivered to the dispensing chamber 4. As can be seen from Fig 6, an inner wall 35 of the lower region is spaced inwardly of a base of the upper region, towards the  
25 drum of the machine, so that composition which falls from the upper region under the force of gravity in the period between the first and second spins, when subjected to centrifugal forces during the second spin, will be restrained by a ledge 36 and thus be prevented from passing  
30 back into the upper region 31.

The invention is not limited to the embodiments and process steps described herein which may be varied in both construction, detail and sequence without departing from the  
35 spirit of the invention.

- 10 -

**CLAIMS**

1. A device for dosing fabric treatment composition to a  
5 drum of a top loading automatic washing machine of the  
type comprising a washing stage and at least two spin  
cycles, the device comprising at least three  
interconnected chambers mounted to a drum of the  
washing machine, namely:-
- 10 - a reservoir chamber having filling opening means and an  
outlet;
- a holding chamber communicating with the reservoir  
15 chamber outlet for receiving said composition from said  
reservoir chamber during a first of said spin cycles;  
and
- a dispensing chamber communicating with a holding  
20 chamber outlet for receiving said composition from said  
holding chamber during a second of said spin cycles,  
the dispensing chamber further including an outlet for  
dispensing said composition upon substantial completion  
of said second spin cycle.
- 25
2. A device as claimed in claim 1 in which the holding  
chamber comprises an upper region which receives and  
holds treatment composition from the reservoir chamber  
30 during the first spin cycle, a lower region which  
delivers treatment composition to the dispensing  
chamber during the second spin cycle, and an  
intermediate region connecting the upper and lower  
regions such that between the first and second spin

- 11 -

cycles the treatment composition is transferred under the force of gravity from the upper to the lower region.

5

3. A device as claimed in claim 2 in which the upper and lower regions comprise distinct upper and lower compartments and wherein the intermediate region comprises a conduit connecting the compartments.

10

4. A device as claimed in claim 3 in which the conduit is arranged on a base of the upper compartment, wherein the base is preferably shaped to funnel treatment composite into the conduit.

15

5. A device as claimed in claims 3 or 4 in which the holding chamber has a rear wall facing a wall of the drum of the machine, and a front face, and wherein the conduit is spaced from the rear wall.

20

6. A device as claimed in any preceding claim in which at least three chambers are connected in series.

25

7. A device as claimed in any preceding claim including means for the mounting thereof to an interior of the drum of the machine.

30

8. A device as claimed in claim 7 including means to allow retro-fitting of the device to the drum of the machine.

9. A device as claimed in any of claimed in any of claims 6 to 8 in which the reservoir chamber has a rear

- 12 -

portion adjacent the drum of the machine, an opposed front portion, and a top portion, wherein the reservoir chamber outlet means is disposed adjacent the rear and top portions of the chamber.

5

10. A device as claimed in claim 9 in which the rear and top portions are shaped to funnel treatment composition into the reservoir chamber outlet under the centrifugal forces generated during the first spin cycle.

10

11. A device as claimed in any of claims 2 to 10 in which the holding chamber outlet means is disposed adjacent an upper rear portion of the lower region.

15

12. A device as claimed in any preceding claim in which the dispensing outlet is disposed towards a lower portion of the dispensing chamber.

20

13. A device as claimed in any preceding claim in which the reservoir chamber includes closure means for the filling opening.

25

14. A laundry washing machine comprising a device as claimed in any preceding claim.

15. In combination, a device according to any of claims 1 to 13, and a fabric treatment composition, such as a liquid rinse conditioner.

30

16. Use of a device as claimed in any of claims 1 to 13 for delivering liquid rinse conditioner to an interior of a

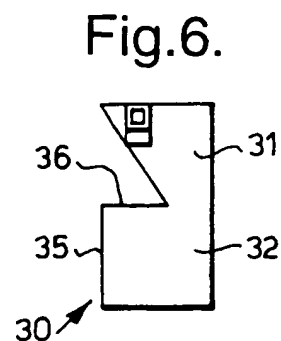
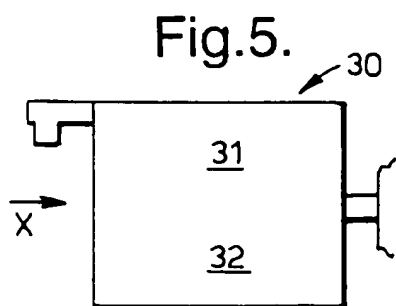
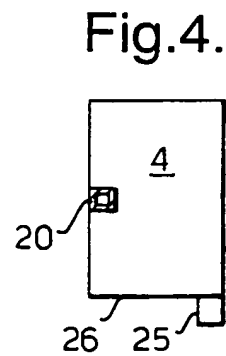
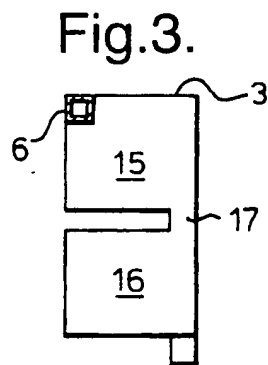
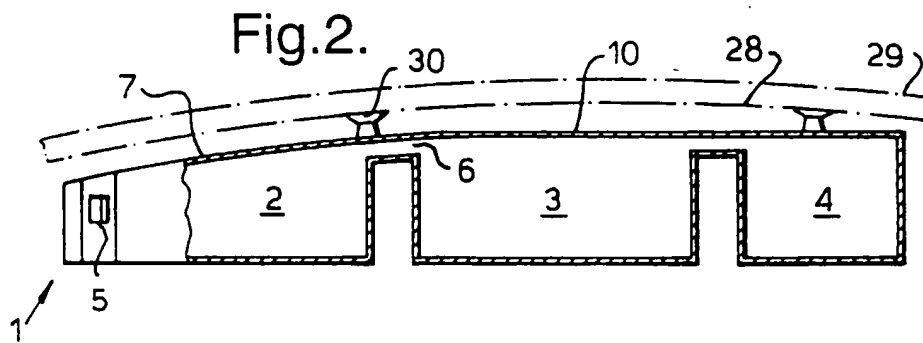
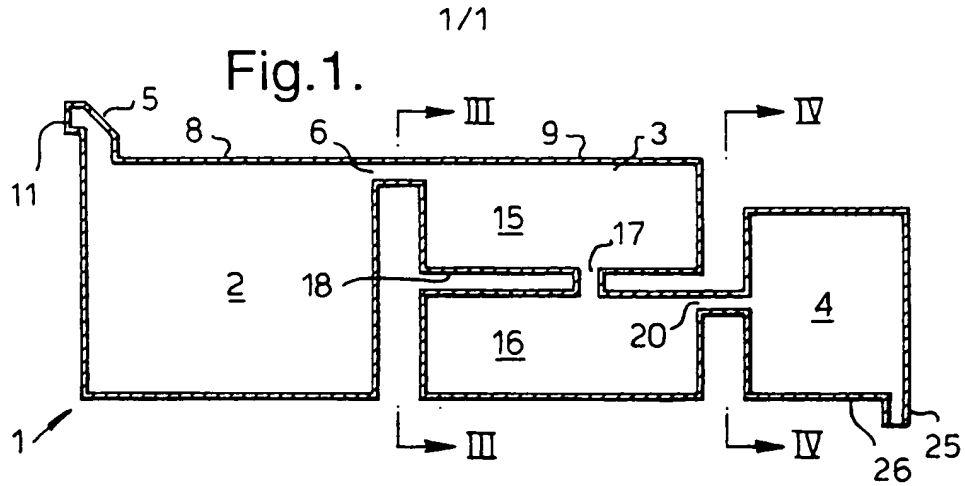
- 13 -

drum of a washing machine during a rinse cycle of an automatic washing machine.

17. A process for delivering fabric treatment composition  
5 to an interior of a drum of a washing machine during a  
rinse cycle of the machine by employing a device  
according to any of claims 1 to 13, the process  
comprising the steps of:-
- 10 - adding fabric treatment composition to the  
reservoir chamber prior to a start of wash cycle;
  - carrying out a wash cycle;
  - 15 - carrying out the first spin cycle whereupon the  
fabric treatment composition is transferred under  
centrifugal forces from the reservoir chamber to  
the holding chamber;
  - 20 - carrying out the second spin cycle whereupon the  
treatment composition is transferred under  
centrifugal forces from the holding chamber to the  
dispensing chamber;
  - 25 - delivering the treatment composition from the  
dispensing chamber to the interior of the drum  
under force of gravity prior to and/or during  
addition of final rinse solution;
  - 30 - carrying out a final rinse cycle by agitating the  
fabrics, rinse solution and treatment composition  
for an effective period of time; and
  - carrying out a final spin
  - 35



1/1



SUBSTITUTE SHEET (RULE 26)

# INTERNATIONAL SEARCH REPORT

Intern. nat. Application No.

PCT/EP 00/00801

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 D06F39/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 792 701 A (GENERAL ELECTRIC COMPANY) 21 May 1957 (1957-05-21)	1-7, 11-17
A	the whole document	8-10
	---	
A	US 4 186 573 A (WHIRLPOOL CORPORATION) 5 February 1980 (1980-02-05)	1,7,8, 14-17
	the whole document	
	-----	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*S\* document member of the same patent family

Date of the actual completion of the international search

28 June 2000

Date of mailing of the international search report

05/07/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Courrier, G

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/00801

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2792701 A	21-05-1957	NONE	
US 4186573 A	05-02-1980	NONE	